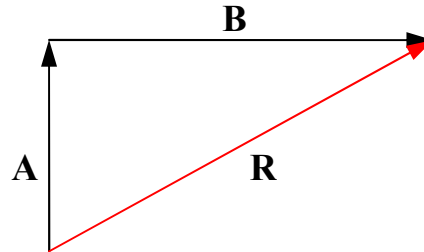


## Adding and Subtracting Perpendicular Vectors using Trigonometry

Given these vectors: **A = 15 m/s (N)**, **B = 25 m/s (E)**, find the magnitude and direction of the following:

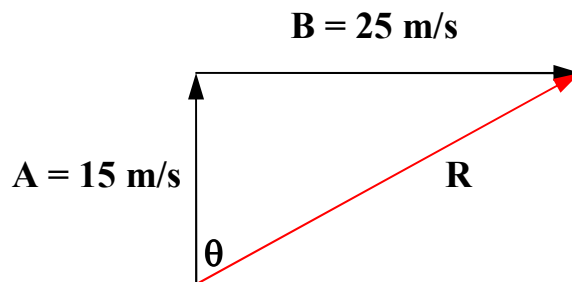
**a)  $A + B = R$ :**



First, find the magnitude of the resultant using pythagoras:  $a^2 + b^2 = R^2$

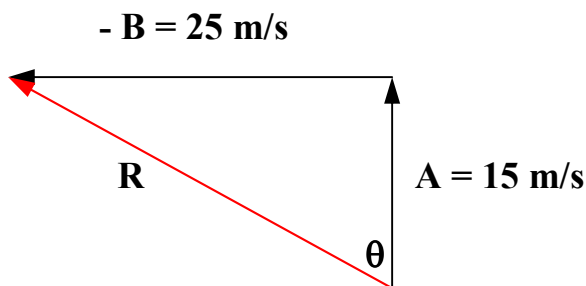
$$\rightarrow 15^2 + 25^2 = R^2 \quad \rightarrow R = 29 \text{ m/s}$$

Now, use inverse (arc) tangent to find the angle:



$$\tan \theta = \frac{25}{15} \quad \rightarrow \theta = 59^\circ \quad \rightarrow R = 29 \text{ m/s (} 59^\circ \text{ E of N)}$$

**b)  $A - B = R$**



$\rightarrow$  Here,  **$R = 29 \text{ m/s (} 59^\circ \text{ W of N)}$**   $\rightarrow$  same magnitude, but different direction!